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The Recessionary Impact on the Earnings and Unemployment of High School and College Graduates

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Abstract
According to the College Board's (2014) most recent report, the cost of investing in a four-year undergraduate degree in the United States has nearly tripled within the past twenty years. This trend in tuition prices and student debt has sparked the question as to whether it still pays to go to college. Specifically, several scholars believe that the increased costs of investing in higher education outweigh the economic benefits of higher wages and job security that are often provided to workers with a college degree. On the other hand, many continue to value a college education and believe that such an investment is important for acquiring the necessary skills that will help them become successful in the labor market. In order to determine whether the major economic benefits of a college degree continue to outweigh the gains of not pursuing higher education, a comparison of the wage and unemployment rate fluctuations of high school graduates and college graduates during the most recent economic downfall can be utilized to reveal which group is least susceptible to the adverse impacts of a recession. Due to the higher productivity levels often associated with a college degree that increase the likelihood of receiving specific on-the-job training, it can be hypothesized that workers with a bachelor's degree will be less vulnerable to decreased earnings and unemployment during periods of economic decline.

Keywords
recession, employment, impact, difference-in-difference estimator

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According to the College Board's (2014) most recent report, the cost of investing in a four-year undergraduate degree in the United States has nearly tripled within the past twenty years. This trend in tuition prices and student debt has sparked the question as to whether it still pays to go to college. Specifically, several scholars believe that the increased costs of investing in higher education outweigh the economic benefits of higher wages and job security that are often provided to workers with a college degree. On the other hand, many continue to value a college education and believe that such an investment is important for acquiring the necessary skills that will help them become successful in the labor market. In order to determine whether the major economic benefits of a college degree continue to outweigh the gains of not pursuing higher education, a comparison of the wage and unemployment rate fluctuations of high school graduates and college graduates during the most recent economic downfall can be utilized to reveal which group is least susceptible to the adverse impacts of a recession. Due to the higher productivity levels often associated with a college degree that increase the likelihood of receiving specific on-the-job training, it can be hypothesized that workers with a bachelor's degree will be less vulnerable to decreased earnings and unemployment during periods of economic decline.

While there are various methods that can be utilized to uncover the impact of the 2007 recession on the earnings and unemployment rate of high school and college graduates, the difference-in-difference estimator provides the simplest approach to revealing how this particular economic event altered labor market opportunities for these two groups. High school graduates serve as the treatment group since it is hypothesized that workers who do not invest in higher education will experience more negative impacts during a recession than college graduates in the control group. Furthermore, the comparison of recessionary impact differences in the levels of educational attainment between high school graduates and college graduates specifically refers to an assessment of economic differences between workers with a high school diploma and workers with a bachelor's degree, respectively. In order to control for the greater volatility in unemployment and income that is typically observed in the younger population, the data provided for each group focuses on economic information about United States civilian noninstitutional full-time workers who are age 25 and over. This information reflects income and unemployment data gathered from the Current Population Survey (CPS) in 2006, 2010, and 2014. By utilizing data from these particular years, the difference-in-difference estimator will ultimately provide a more detailed illustration of the earnings and unemployment trends that occurred before and after the 2007 financial crisis.

Beginning with an analysis of the recessionary impact on mean yearly earnings of U.S. workers, the average annual income of high school graduates increased by 0.09% between 2006 and 2010 while the mean yearly earnings of workers with a bachelor's degree grew by 8.62% during the same time period (United States Census Bureau, 2006 & 2010). These observations can be explained by the concept of specific training which states that profit-maximizing firms will lay off newly hired workers during recessionary periods. This trend occurs because workers who have been with a particular firm for many years receive more specific training than new employees and therefore have a value of marginal product that exceeds their wage (Borjas, 2013). Since the data being analyzed only represents workers who are 25 years old and over, the exclusion of younger individuals who are most likely to be recently hired causes the average wage to rise for both groups of workers.

Although the mean yearly earnings during the recession increased for high school and college graduates, workers with a bachelor's degree experienced a more significant rise in their average annual income. This substantial difference in earnings growth may be due to differences in pay structure that are commonly observed between these two groups. Specifically, studies have found that workers who have not achieved higher levels of education are often compensated at an hourly rate while workers with a college degree are more likely to be salaried (DeVoe, Lee, & Pfeffer, 2010). Because the average workweek during the recession fell from 40 hours to 33 hours, the earnings of high school graduates, especially those receiving overtime premiums, were adversely impacted (Lowenstein, 2009). As a result, the wage gap between workers with a high school diploma and those with a bachelor's degree widened by 8.53% between 2006 and 2010.

In addition to the increased wage gap between high school and college graduates, the Great Recession also had unfavorable effects on the unemployment rates of both groups of workers. The overall unemployment rate in the U.S. reached record levels due to the absence of "labor hoarding" that is normally practiced by firms during periods of economic decline. Rather than keeping a majority of their employees in order to avoid incurring search and training costs during the recovery period, firms became less optimistic about economic improvements and began to lay off many of their workers (Lowenstein, 2009). Despite the increase in unemployment levels encountered by all groups of workers during the recession, high school graduates experienced a more significant rise in unemployment rates compared to workers with a bachelor's degree. Between 2006 and 2010, the unemployment rate of high school graduates grew by 6% while the unemployment rate of college graduates increased by a much smaller 2.7% (United States Bureau of Labor Statistics, 2011).

The concept of specific training can once again be implemented to support the notion that education lowers workers' unemployment rate. As Borjas (2013) explains, "specific training 'marries' firms and workers, [therefore] firms are less likely to lay off educated workers when they face adverse economic conditions" because productivity gains are lost once these workers leave the organization. Moreover, educated workers seem to have better access to information about alternative job opportunities which allows them to reduce their probability of experiencing frictional unemployment when switching jobs (Borjas, 2013). Thus, the higher productivity levels and enhanced networking opportunities of individuals with a college education caused the unemployment rate of workers with a bachelor's degree to be 3.3% lower than the unemployment rate of high school graduates.

Given the results of the difference-in-difference estimators for earnings and unemployment between 2006 and 2010, it can be concluded that workers without higher levels of educational attainment were more susceptible to sluggish income growth rates and layoffs during the Great Recession. These results can be compared to the earnings and unemployment trends observed during the recovery period in order to gain a better understanding of differences in labor market trends between high school and college graduates. Between 2010 and 2014, the 8.27% increase in mean yearly earnings of workers with a high school diploma was more favorable than the 2.81% growth of yearly earnings for college graduates (United States Census Bureau, 2010 & 2014). This information coincides with the increase in work hours commonly observed during recovery periods. That is, as economic conditions improve, firms typically increase hours among workers to meet the rising customer demand for their products or services (United States Bureau of Labor Statistics, 2010). Since a majority of hourly wage workers are those without a college education, it can be inferred that an increase in work hours caused the earnings growth rate for high school graduates to be higher than the earnings growth rate of workers with a bachelor's degree. Along with the higher earnings growth rate observed for workers with a high school diploma, the unemployment rate of high school graduates fell by 3% more than the unemployment rate of workers with a bachelor's degree (United States Bureau of Labor Statistics, 2011 & 2014). Much of the improvement in unemployment rates observed for high school graduates can be attributed to the rapid growth of entry level jobs that began following the Great Recession. While higher-wage industries have added 2.6 million positions during the recovery, lower-wage industries have created 3.8 million new jobs during the same time period (Lowrey, 2014). High school graduates are the most likely to work in these new lower-wage positions due to their higher discount rate which causes them to attach a low value to future earnings opportunities (Borjas, 2013). In other words, high school graduates find it more beneficial to be employed in a lower-wage industry than to remain jobless until higher-paying opportunities emerge. This present-oriented mindset is contrasted by workers with a bachelor's degree. Because a college degree serves as a signal of higher work productivity, employers typically invest more in the human capital of college graduates by providing them with specific on-the-job training (Borjas, 2013). These workers therefore have little incentive to find alternative job opportunities during periods of unemployment because they will suffer a capital loss if they choose to change employers (Borjas, 2013). Thus, the difference in unemployment rate decline between workers with a high school degree and workers with a bachelor's degree can be explained by the higher discount rate of high school graduates that causes them to have a higher marginal search cost, a lower asking wage, and a higher probability of accepting entry-level job offers.

After analyzing the earnings and unemployment trends for high school and college graduates during and after the most recent recession, it can be concluded that the economic benefits of attaining a bachelor's degree continue to outweigh the benefits of not pursuing higher education. The results from the difference-in-difference estimator during the periods of the financial crisis demonstrate that workers with a bachelor's degree not only saw a steeper increase in their mean yearly earnings, but also encountered lower unemployment rates compared to individuals with a high school diploma. Furthermore, post-recessionary labor market trends reveal that individuals who do not invest in a college education are more likely to accept lower-wage positions during the recovery. While high school graduates continue to experience higher earnings and employment growth rates, these favorable results are offset by the significant adverse recessionary impacts on these same economic indicators. Ultimately, the outweighing benefits of attaining a college degree should encourage U.S. policy makers to continue to implement and enhance educational programs that strive to make higher education more accessible to students and young adults across the country.

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Appendix

The Impact of the "Great Recession" on the Mean Yearly Earnings of U.S. Workers				
	2006	2010	Difference (%)	Difference-in-Difference (%)
High School Diploma	$ 32,789	$ 32,820	0.09%	
Bachelor's Degree	$ 54,665	$ 59,378	8.62%	-8.53%

The Impact of the "Great Recession" on the Unemplyment Rate of U.S. Workers				
	2006 (%)	2010 (%)	Difference (%)	Difference-in-Difference (%)
High School Diploma	4.3%	10.3%	6.0%	
Bachelor's Degree	2.0%	4.7%	2.7%	3.3%

The Post-Recessionary Impact on the Mean Yearly Earnings of U.S. Workers				
	2010	2014	Difference (%)	Difference-in-Difference (%)
High School Diploma	$ 32,820	$ 35,533	8.27%	
Bachelor's Degree	$ 59,378	$ 61,048	2.81%	5.45%

The Post-Recessionary Impact on the Unemplyment Rate of U.S. Workers				
	2010 (%)	2014 (%)	Difference (%)	Difference-in-Difference (%)
High School Diploma	10.3%	5.7%	-4.6%	
Bachelor's Degree	4.7%	3.1%	-1.6%	-3.0%